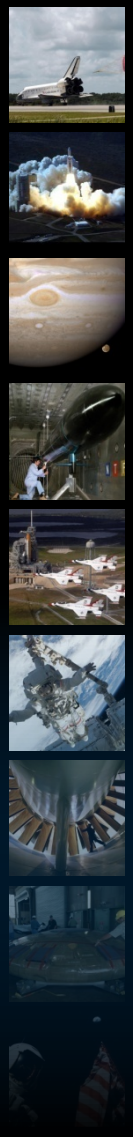
National Aeronautics and Space Administration



NASA and Unmanned Aircraft Systems

Know the Rules

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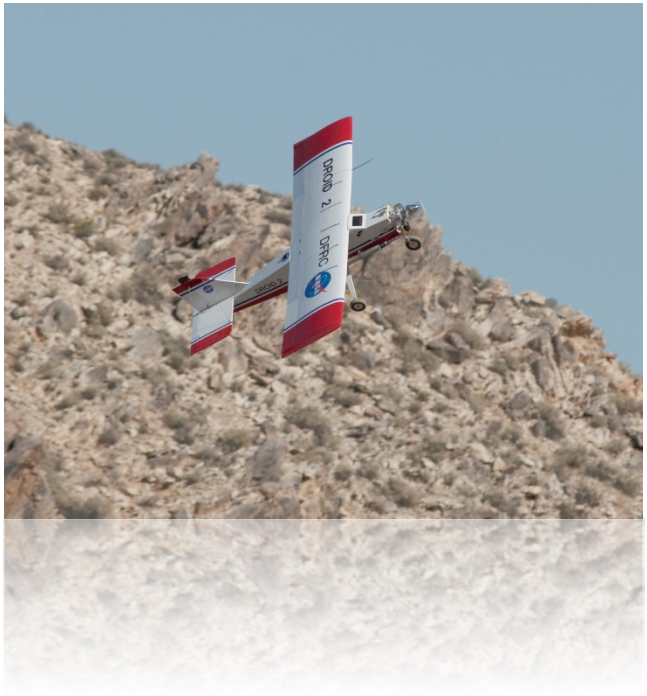

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Unmanned Aircraft System (UAS)

- An Unmanned Aircraft System (UAS) includes an unmanned aircraft and all associated support equipment (e.g., control station, data links, telemetry, communications and navigation equipment) necessary to operate the unmanned aircraft.

The Basics

- The Federal Aviation Administration (FAA) defines a UAS as aircraft per Title 14 CFR, Aeronautics and Space.
- UAS can be powered or unpowered aircraft. A UAS does not carry a human operator.
- A UAS can fly autonomously, or it can be remotely piloted from a ground station or over the horizon via satellite links.
- The size of a UAS can range from a micro vehicle measuring inches in size and ounces in weight to a large aircraft weighing more than 30,000 pounds.

Federal Aviation Administration (FAA)

- To fly a NASA UAS outside of restricted airspace, a Certificate of Authorization (COA) from the FAA must be obtained.
  - A COA allows a public operator to use a defined block of airspace and includes special safety provisions unique to the proposed operation.
- The FAA works with organizations to develop conditions and limitations for UAS operations to ensure they do not jeopardize the safety of other aviation operations.
- NASA and the FAA entered into a Memorandum of Agreement (MOA) in 2013 that provides small NASA UAS (under 55 pounds) access to uncontrolled airspace below specified altitudes under COA by Notification procedures.
- NASA is renegotiating the MOA with the FAA to incorporate proposed small UAS regulations that provide civilian UAS operators greater access.

NASA UAS and Range Safety Procedural Requirements

- UAS operational procedures are found in NPR 7900.3, Aircraft Operations Management Manual:
  - Acquisition processes are spelled out for Category I, II and III UAS.
  - UAS operations shall be conducted under the oversight of the Center Flight Operations Office.
  - Centers without a Flight Operations Office shall contact HQ Aircraft Management Division to have a Center assigned to assist with UAS Operations.
  - Center Flight Operations Offices shall ensure UAS airworthiness certification and certification of UAS pilots to NASA standards.
  - UAS pilots must be designated, in writing, by their Flight Operations Office identifying which vehicles they are authorized to operate.
- NPR 8715.5, Range Flight Safety Program:
  - NASA policy is to mitigate and control hazards and risks associated with range operations in accordance with NPR 8715.5 requirements.
  - Centers that operate UAS must have a Range Safety Officer.
  - A hazard risk assessment shall be completed for each operation whether in restricted or uncontrolled airspace to mitigate the risk to the safety and health of the public, the workforce and property.

The Takeaway

- Center employees are purchasing UASs easily.
- A UAS is an attractive, cost-effective option to conduct research.
- A UAS can be purchased for as little as $350, **but operating them for government purposes requires NASA to implement policies to ensure safety**.
- While upfront costs may be low, the logistics tail can be significant:
  - Airworthiness
  - Crew Certification
  - Range Safety
  - FAA COA to operate outside of restricted airspace

Know the Rules